

SWRCB Salmonids and Pelagic Organisms workshop

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U.S. Fish and Wildlife Service

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Outline

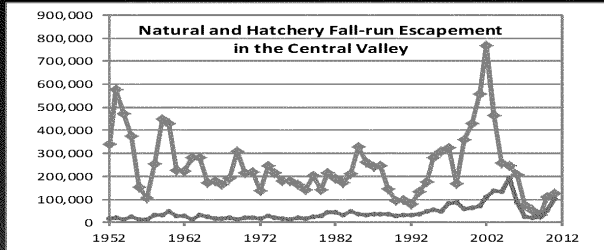
- What additional scientific information should be considered to inform potential changes to the Bay-Delta plan?
- How should the State Board address scientific uncertainty and changing circumstances?
- * Key Points from previous submittals



Key points

The Board should consider UPDATED information on:

1. the status of the stocks (escapement and adult production, and relative contribution by hatchery stocks)



Indicators demonstrate continued decline of CV salmonid populations

More protection is needed to meet the salmon narrative WQCP goal and CVPIA's AFRP doubling goal.

* Changes in Delta flows and flow variability have contributed to declines of multiple native species, including salmonids (DOI, 2010)

* The fundamental components of the natural flow regime, have been substantially altered by human activity (DOI, 2010).

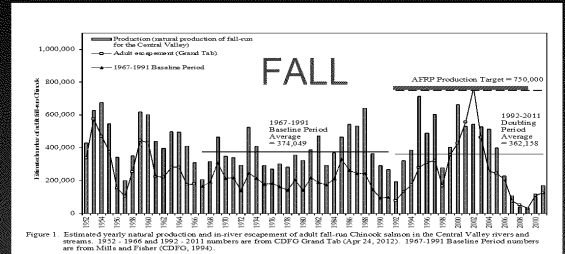


Figure 1 Estimated yearly adult natural production and in-river escapement of adult fall-run Chinook salmon in the Central Valley rivers and streams. 1952 - 1966 and 1992 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

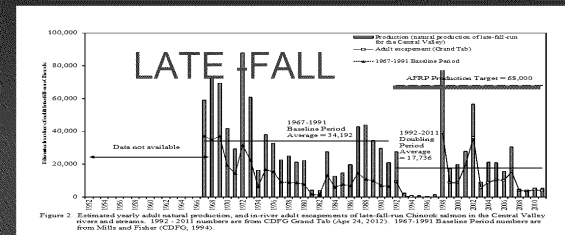


Figure 2 Estimated yearly adult natural production, and in-river adult escapement of late-fall-run Chinook salmon in the Central Valley rivers and streams. 1952 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

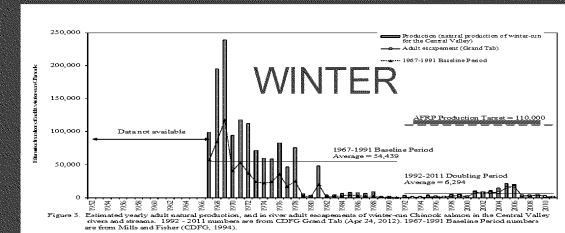


Figure 3 Estimated yearly adult natural production, and in-river adult escapement of winter-run Chinook salmon in the Central Valley rivers and streams. 1952 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

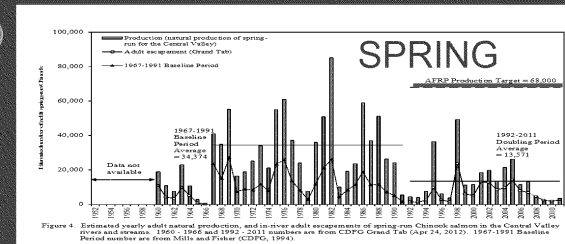


Figure 4 Estimated yearly adult natural production, and in-river adult escapement of spring-run Chinook salmon in the Central Valley rivers and streams. 1952 - 1966 and 1992 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).



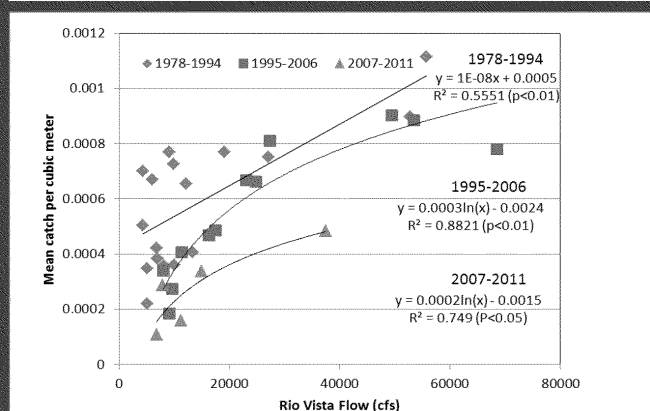
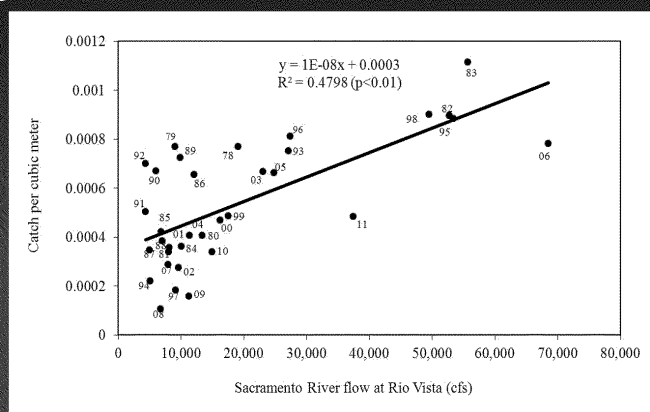
Key points

The Board should consider UPDATED information on:

1. the status of the stocks (escapement and adult production, and relative contribution by hatchery stocks)
2. juvenile salmon indices at Chipps Island relative to flow

Juvenile salmon production leaving the Delta is higher at higher flows

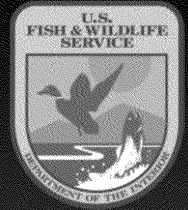
- * Flow is one of the most important components of ecosystem function (DOI, 2012).
- * Delta inflow and outflow are important for salmon migration cues and juvenile survival and abundance in the Delta (DOI, 2010).
- * Mechanisms for increased survival at higher flows include:
 - reduced water temperature,
 - lower proportion of flow diverted,
 - reduced entrainment,
 - lower predation and disease,
 - elimination of reverse flows,
 - increased floodplain habitat (DOI, 2010).



Source: FWS , unpublished data

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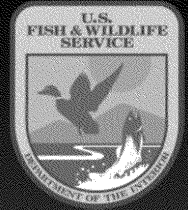
Key points



The Board should also consider RECENT information on:

3. the temporal distribution of all runs of Chinook salmon in the Delta based on genetic analyses.

Key points

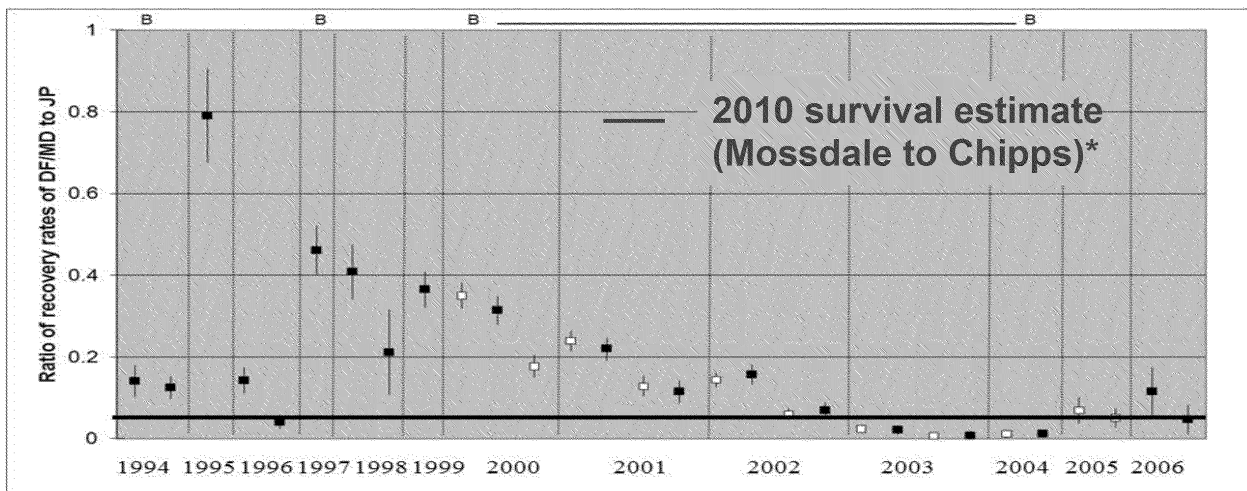


The Board should also consider RECENT information on:

3. the temporal distribution of all runs of Chinook salmon in the Delta based on genetic analyses
4. juvenile salmon survival estimates from the 2010 VAMP and 2012 Stanislaus studies
(and 2011 and 2012 south Delta study results when available)

Juvenile salmon survival was low (0.05) in 2010 relative to many of the past years

Salmon smolt survival from Mossdale (black) or Durham Ferry (white) to Jersey Point



1994-2006 studies used coded wire tagged fish;
2010 study used acoustically tagged fish, removing predator like detections
*Additional mortality between Jersey Point and Chipps Island is assumed to be low.

B = Years with physical Head of Old River installed
Non-physical barrier installed in 2010.

Source Brandes et al., 2008. and SJRG, 20

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Key points



The Board should also consider new information on:

5. Increasing the duration of DCC gate closures *(and eliminating bidirectional tidal flows into Georgiana Slough) (DOI, 2010)

Key points

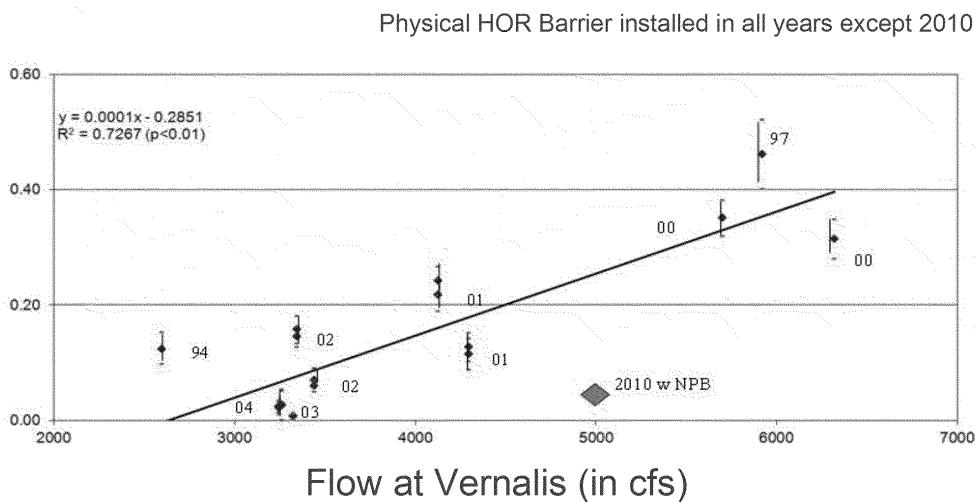


The Board should also consider information on:

5. Increasing the duration of DCC gate closures
*(and eliminate bidirectional tidal flows into Georgiana Slough)
6. the benefits to salmon of flow with a physical barrier at the head of Old River – under hydrodynamic conditions still protective of delta smelt

Salmon survival with a physical HORB is related to flow and higher than when the non-physical barrier was installed

Survival from DF or Mossdale to JP



Source: SJRG, 2007 and SJRG, 2011

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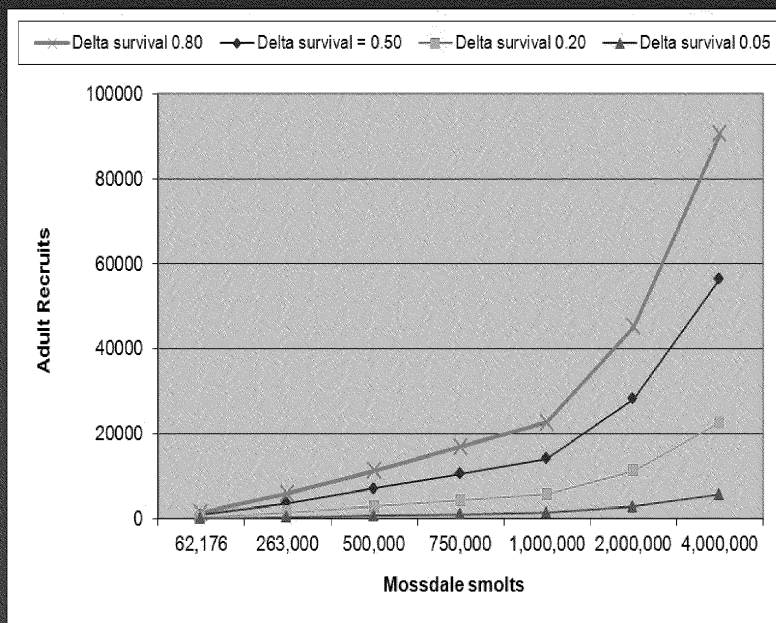
Key points



The Board should also consider :

7. the relationship between upstream juvenile production and simulated Delta survival to hypothetical adult recruitment in the San Joaquin basin

The simulated relationship between juvenile smolt production at Mossdale, Delta survival and adult recruits



In addition, DOI has previously provided information on:

- * Simulations that indicate a 0.50 survival rate through the Delta could meet the doubling goal in 27 years.

- * Estimates of flow levels needed at Vernalis to achieve doubling of Chinook production in the San Joaquin basin.

Source: DOI, 2011

Key points



The Board should also consider :

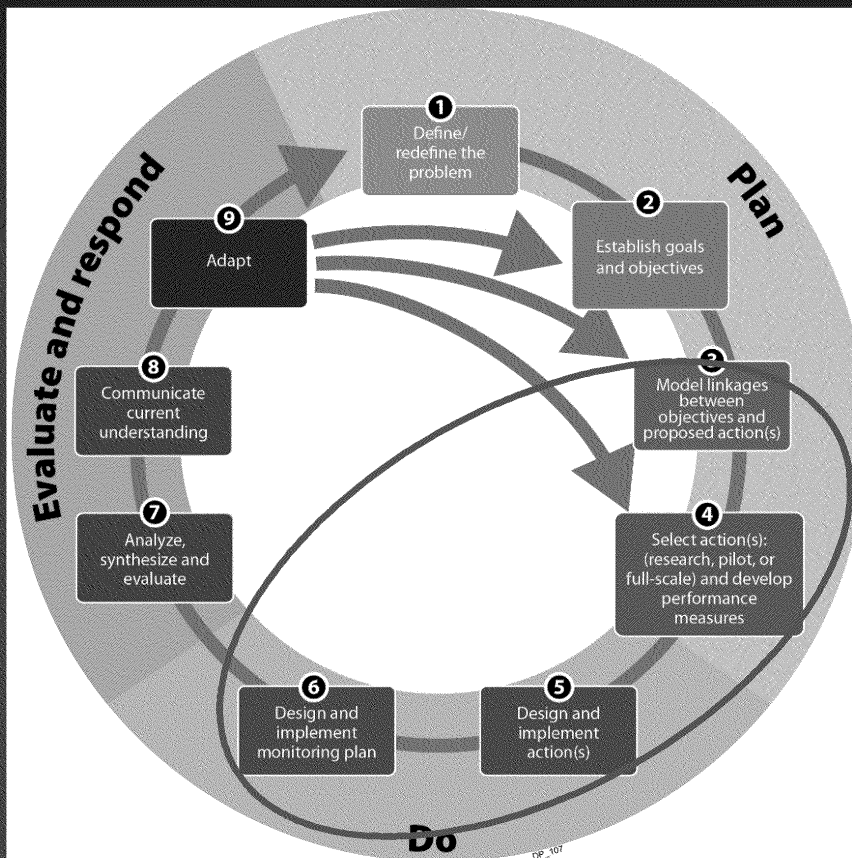
7. the relationship between upstream juvenile production and simulated Delta survival to hypothetical adult recruitment in the San Joaquin basin
8. the importance of continued survival monitoring, upstream and in the Delta

Key points



- The Board should address scientific uncertainty and changing circumstances
 - with an adaptive management plan (AMP) but consider a more protective approach while AMP development proceeds.
- * Although there is uncertainty, there is evidence that increased flows will benefit native fishes, including salmonids by increasing survival through the Delta (DOI, 2010).

Adaptive Management



Specific biological and physical indicators at multiple scales are needed for monitoring, refinement of models and for use in adaptive management

A range of flow criteria alternatives need to be identified for AM to ultimately achieve biological goals and objectives

DOI Technical and Application Guides may be helpful for implementing AM

From: DFG September 5, 2012 presentation: Delta Stewardship Council. 2012. Final Staff Draft of the Delta Plan. Available online: <http://deltacouncil.ca.gov/delta-plan>. Accessed 8/10/12.

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Key points



*Increased flows that mimic the general seasonality, variability, magnitude and duration of the natural hydrograph will benefit native fishes including salmonids. (DOI, 2011)

* The Board should also consider flow objectives based upon a similar percent of unimpaired flow from each of the San Joaquin tributaries to meet the Vernalis objectives. (DOI, 2011)